**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_Date\_\_\_\_\_\_\_\_\_**

**Physical Science Semester Review #2**

**Motion & Force**

***Concept Questions***

1. What is a force?
2. What is the difference between mass and weight?
3. Where will you weigh more Jupiter or the moon? Why?
4. Give an example of each of the following:
	1. Distance unit\_\_\_\_\_\_\_\_\_\_
	2. Time unit\_\_\_\_\_\_\_\_\_\_\_\_
	3. Velocity unit\_\_\_\_\_\_\_\_\_\_
	4. Acceleration unit\_\_\_\_\_\_\_
	5. Force unit\_\_\_\_\_\_\_\_\_\_\_\_
	6. Mass Unit\_\_\_\_\_\_\_\_\_\_\_\_
	7. Momentum Unit\_\_\_\_\_\_\_\_
5. What question will be asked in a problem if you are wanting to solve for:
	1. Time\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Distance\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. What is the difference between distance and displacement?
7. What is the difference between speed and velocity?
8. What does it mean if your acceleration is negative?
9. True or False: a car sitting still does not have acceleration.
10. True or False: a car sitting still does not have inertia.
11. Which has more inertia: a big truck or a bicycle? WHY?
12. If we had no air resistance, which would hit the ground first: a piece of paper or a hammer?
13. State Newton’s Three laws of motion:
	1. First Law:
	2. Second Law:
	3. Third Law:
14. If you have 1300 units of momentum before a process, how many will you have to have after the process is complete?
15. What is the different between an elastic and inelastic collision?
16. What is impulse?
17. Graphing Skills. Use each graph’s letter to answer the following:



* 1. Which graph represents a car moving with constant speed? \_\_\_\_\_\_
	2. Which graph represents a car moving with negative acceleration? \_\_\_
	3. Which graph represents a car standing still? \_\_\_\_\_\_
	4. Which graph represents a car with positive acceleration? \_\_\_\_\_\_\_
1. Complete the chart below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Forces Present:** | **Resulting Amount of Force?** | **Will there be motion?** | **If Yes, What direction?** |
|  |  |  |  |
|  |  |  |  |

***Math Questions***

1. A horse runs 300 meters in 10 seconds. What is its speed?
2. A car travels 340 km at a speed at 20 km/hr. How long does it take the car to arrive?
3. A car travels 45 m/s for 5 seconds. How far has it gone?
4. Billy travels from 30 m/s to 65 m/s in 7 seconds. What is his acceleration?
5. Emily goes from 60 mi/hour to a stop in 6 seconds. What is her acceleration?
6. What is the mass of an object if it exerts a force of 300 N and is accelerating at a rate of 3 m/s2?
7. What force is exerted if you have an object that has a mass of 25 kg and an acceleration of 5 m/s2?
8. A force of 1775 N is exerted on a motorcycle weighing 900 kg and its passenger weighing 95 kg. What is the acceleration?
9. What is the momentum of an object if its mass is 40 kg and its velocity is 5 m/s?
10. What is the mass of an object that has a momentum of 1275 kg\* m/s and a velocity of 3.25 m/s?
11. What is the impulse of 40 kg runner that travels from 5 m/s to 11 m/s?
12. An object travels from 50 m/s to 75 m/s with an impulse of 500 kg \* m/s. What is the mass of this object?
13. A baseball pitcher throws a fast ball with 100 kg\*m/s impulse. If he applied the force in 0.15 seconds, what force did he apply?

*HONORS ONLY:*

1. A loaded freight train (20,000 kg) rolls at 3 m/s towards a resting car (1000 kg). Upon collision, the two cars lock together. What is the speed of the cars after the collision?
2. Two cars collide head on. Car A has a mass of 100 kg; car B has a mass of 2000 kg. If before the collision A was traveling at 8 m/s and B was traveling at 3 m/s, What is the speed of car B after the collision if car A travels at 4 m/s after the collsion?